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RANGE EXPANSIONS OF SOME GRASSES IN VERMONT

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ABSTRACT

Distribution data are updated for 14 Poaceae taxa considered rare in Vermont 20 years ago. Two of the natives studied, *Glyceria acutiflora* and *Sporobolus asper,* are still rare, have lost historical populations, and face potential human alteration of their habitats. They are recommended for Endangered species status in Vermont. Six native species have expanded their range north. Seven native species are now weedy in disturbed habitats. Railroads and roadsides provide habitat and a means of dispersal for the weedy species. *Aristida basiramea* and *Diplachne acuminata* are novelties in the Vermont flora.

Key Words: endangered species, grasses, range extensions, rare species, Vermont flora, weeds

Distributions of Vermont's grasses were well documented between the 1870's and the 1930's. Since then, only Frank Seymour seriously collected or wrote about Vermont's grasses. Many grasses expanded their ranges since Seymour's 1969 *Flora of Vermont* was published. For example, *Puccinellia distans* (L.) Parl. increased dramatically in Vermont since it was initially discovered in 1966 (Seymour, 1967; Zika, 1988). This finding prompted a study of the changing distributions of 14 grass taxa considered rare in Vermont 15 years ago. Rarity was defined as known from three or fewer historical sites. In addition, this study investigated the suggestion by Countryman (1978) that many of the supposedly rare grasses in Vermont might simply have been overlooked by recent collectors.

The historical sites were visited, where possible, and many new sites were field-checked where the habitat seemed suitable for one or more of the taxa. Herbarium vouchers were deposited at VT unless otherwise noted.

DISTRIBUTION DATA

Aristida basiramea

Aristida basiramea Engelm., a midwestern species, was first collected in Vermont in 1975 in a railroad yard in White River Junction, Windsor Co. (*Sundell 1308* HNH). It is now a dominant grass at Sundell's station. Recent Vermont records are largely

from railroad right-of-ways: Chittenden Co., Burlington 1981, Milton (sandy field) 1983; Franklin Co., St. Albans 1981; Washington Co., Montpelier Junction (Berlin) 1981, Waterbury 1981; Windham Co., Bellows Falls (Rockingham) 1981; and Windsor Co., White River Junction (Hartford) 1981. The Burlington station apparently was not present in 1975, when the late Harry E. Ahles collected there and recorded two other *Aristida* species (Zika et al., 1983).

Aristida basiramea's range expansion is not unique to Vermont. Smith (1965) noted it increased in northern New York state after 1924. Pease (1964) recorded it from five towns in northern New Hampshire, after first collecting it in 1954. In Maine *A. basiramea* was known from only Oxford Co. (Richards et al., 1983), where since 1938 it spread from two to seven towns (Campbell and Eastman, 1980). Two Canadian stations were located relatively recently in Ontario (Dore and McNeill, 1980).

Aristida dichotoma

Recent field work failed to re-locate historical populations of *Aristida dichotoma* Michx. reported by Seymour (1982) in Pownal (1904) and New Haven (1878–96); these populations are assumed extirpated. A station reported in Essex by Flynn (1911) is based on *Sporobolus neglectus* Nash (*Flynn s.n.* TUFT). In 1977, Ladd (1979, unpubl. M.S. thesis, S. Ill. U., Carbondale) located an adventive *Aristida dichotoma* colony in the Montpelier Junction railroad yard, while cataloging the flora of Washington Co.

Recent Vermont records of poverty-grass are mostly from train stations: Chittenden Co., Burlington 1981; Franklin Co., St. Albans 1981; Washington Co., Montpelier Junction 1977, 1981, Waterbury 1981; Windham Co., Bellows Falls 1981, Brattleboro 1981, Jamaica (sandy roadside) 1981, South Vernon 1984, Vernon (sandy quarry) 1982; Windsor Co., White River Junction 1981, and Windsor 1981.

The Burlington population apparently was not extant in 1975, when Ahles collected at the site and recorded two other *Aristida* species (Zika et al., 1983).

Aristida oligantha

Aristida oligantha Michx., is common on railroad lines where it is indigenous in the midwest (e.g., Muhlenbach, 1979). It ap-

parently disperses well as an adventive along railroads in the northeast. The first Canadian record (Catling et al., 1978) and the first New Hampshire record (1977 *Ahles 84918* MASS, NHA) are from train tracks. Ahles discovered the taxon in Vermont in 1975, in Burlington, Chittenden Co. (Zika et al., 1983). It is now abundant at the original collection site, a railroad yard on the shore of Lake Champlain. In 1981, *A. oligantha* was collected along railroads in: Franklin Co., St. Albans; Windham Co., Bellows Falls, Brattleboro; Windsor Co., White River Junction, and Windsor.

Diplachne acuminata

Diplachne acuminata Nash [= *Leptochloa fascicularis* (Lam.) A. Gray var. *acuminata* (Nash) Mohlenbrock], sprangletop, is a new genus and species in the flora of Vermont. This Eurasian adventive is expanding its range north and east (McNeill, 1979). It first reached southern Canada in 1976, on a railroad near Niagara Falls (Catling et al., 1978). The first Massachusetts collection was in 1979. The first Vermont collection was in 1981, at a damp siding in the railroad yard on Lake Champlain in Burlington, Chittenden Co. (*Zika 4952* VT, *5249* NEBC, VT). The colony consisted of circa 200 stems in 1985.

Eragrostis capillaris

Countryman (1978) included *Eragrostis capillaris* (L.) Nees, lacegrass, on the state Rare and Endangered species list. Native Rutland Co. populations from calcareous ledges were documented in West Rutland 1909 (Kirk, 1910), West Haven 1937, and Castleton 1980. Adventive populations on railroad tracks were collected in Chittenden Co., Burlington 1975, 1980; Franklin Co., St. Albans 1981; Washington Co., Waterbury 1981; and Windham Co., Brattleboro 1981. The weedy colonies are large. This indigenous species is increasing and does not appear to need legislative protection at this time in Vermont.

Eragrostis frankii

Eragrostis frankii C. A. Mey. ex Steud., also known as lacegrass, is an indigenous species. It was recorded from the shore of the

Connecticut River in the towns of Westminster (1931) and Sharon (1941) when Seymour (1969) wrote his Vermont flora. Countryman (1978) included the species as Rare and Endangered in Vermont. Native colonies on silty shores were recently documented in Addison Co., Ferrisburg 1970; Chittenden Co., Colchester 1983; Orange Co., Braintree 1972; and Windham Co., Vernon 1982. In addition, weedy populations on roadsides were recorded in Bennington Co., East Dorset 1979, and Pownal 1982.

Canadian botanists consider all their *Eragrostis frankii* populations adventive (Dore and McNeill, 1980). With the recent establishment of weedy colonies in Vermont, and an increasing number of native populations, there is no reason to place *Eragrostis frankii* on Vermont's Rare or Endangered species lists.

Glyceria acutiflora

Glyceria acutiflora Torr., manna grass, a native wetland species, was discovered in Vermont in 1910 in Rutland, Rutland Co. (Kirk, 1911). Kirk's station was never re-located and is assumed extirpated by urban expansion. In 1983 a new station of circa 400 culms was found on the margins of a small pond on Austin Hill, West Haven, Rutland Co. (*Zika 7371* VT). The *Glyceria acutiflora* habitat could be altered by succession or by human disturbance. This strongly suggests that the species warrants listing as a state Endangered species (10 V. S. A., Chapter 123).

Leptoloma cognatum

Leptoloma cognatum (Schultes) Chase [= *Digitaria cognatum* (Schultes) Pilger], fall witch-grass, is a native perennial frequently growing with two superficially similar taxa: *Panicum capillare* L. and/or *Eragrostis spectabilis* (Pursh) Steudel. All have red to purplish diffuse panicles, and are common on sunny sandy soils. Since there were few historical records, *Leptoloma* was placed on the Vermont Rare and Endangered list (Countryman, 1978).

Wheeler (1912) collected *Leptoloma* in Townshend in 1911, but did not record it elsewhere in the West River Valley. Underwood (1913) documented *Leptoloma* in Hartland in 1912. Kittredge collected it in nearby West Hartford in 1922. She noted it as "rare" in her Woodstock flora (Kittredge, 1939). Apparently *Leptoloma* increased quickly around Woodstock between the time

Kittredge prepared her manuscript and the time it went to press. For in 1939, Kittredge made a Woodstock *Leptoloma* collection (*Kittredge s.n.* HNH) labeled "rare in New England, abundant in Woodstock."

H. E. Ahles (pers. comm.) pointed out that *Leptoloma* is weedy in Vermont, and does not need legal protection. Over the last 15 years, *L. cognatum* increased dramatically in the lowlands of the Connecticut River, West River and in the sand plains of Chittenden Co. Fall witch-grass has also become common in the White River Valley since 1940.

Recent Vermont records are: Chittenden Co., Burlington-South Burlington town line 1981, Colchester 1981, Essex 1982, South Burlington 1975, 1981; Orange Co., Bradford 1983 observation, Fairlee 1983 observation, Thetford 1983; Rutland Co., Rutland 1983 observation; Windham Co., Brattleboro 1982, Dummerston 1981, Jamaica 1981, North Westminster 1981, Putney 1981, Rockingham 1981, Townshend 1911, 1981, Vernon 1982, Westminster 1981; Windsor Co., Hartford 1983, Hartford-Hartland town line 1981, Hartland 1981, Sharon 1983, Springfield 1973, 1981, and White River Junction 1981.

Leptoloma recently arrived in southern Canada. It is increasing there (Dore and McNeill, 1980), and along the Connecticut and Merrimac Rivers in New Hampshire.

Panicum dichotomiflorum

Panicum dichotomiflorum Michx., smooth panic grass, is a new world native. It was first reported in Vermont in 1968 (Seymour, 1970) as an adventive at a construction site in Burlington. H. E. Ahles collected it in Brattleboro in 1978, and D. M. Ladd reported it from Waterbury (1979, unpubl. M.S. thesis, S. Ill. U., Carbondale) on a sandy river bar. *P. dichotomiflorum* is a pesky annual weed that, in 20 years, successfully invaded many disturbed habitats, including roadsides, sidewalks, railroad yards, waste lots, and cultivated fields. The writer observed many more stations than those cited below. The species, listed by Countryman (1978) as Rare and Endangered, does not require any legal protection.

Recent Vermont records are: Addison Co., Ferrisburg 1981, Middlebury 1981, New Haven Junction 1981; Bennington Co., Bennington 1984 observation; Chittenden Co., Burlington 1968,

1980, 1981, 1985, Colchester 1981, Essex Junction 1981, Richmond 1981, South Burlington 1981; Franklin Co., Highgate 1982, St. Albans 1980, Sheldon 1982, Swanton 1982; Lamoille Co., Johnson 1981; Rutland Co., Rutland 1981; Washington Co., Montpelier Junction 1981, Moretown 1983 observation, Waterbury 1979, 1981; Windham Co., Bellows Falls 1981, Brattleboro 1978, 1981, Jamaica 1981, Vernon 1982; and Windsor Co., White River Junction 1981.

Panicum rigidulum

Panicum rigidulum Nees [= *Panicum agrostoides* Spreng.], panic grass, is a native found on damp sunny banks and shores in southeastern Vermont. Countryman (1978) listed it as Rare and Endangered, citing stations from Hartland (1892–94) and Newfane (1892). The contemporary records include some large weedy colonies, suggesting that the species is increasing in distribution and numbers of individuals, and it should be dropped from Rare or Endangered lists in Vermont.

Recent Vermont records include: Windham Co., Bellows Falls 1939, Dummerston 1982, Guilford 1982, Rockingham 1983, and Vernon 1931, 1982, 1984.

Sporobolus asper

Sporobolus asper (Michx.) Kunth, rough dropseed, was discovered in Vermont in 1877 on Thompsons Point, Lake Champlain, Charlotte, Chittenden Co., by Cyrus Pringle (Brainerd et al., 1900). Pringle's station was never re-located, and is assumed extirpated. The point is now a developed residential area. In 1983, a population of circa 50 plants was found on sunny calcareous ledges at the narrow apex of Button Bay Point, Lake Champlain, Ferrisburg, Addison Co. (*Zika 7770* VT). The habitat is seasonally scoured by lake ice.

Button Bay Point, in Button Bay State Park, receives heavy recreational use in the summer. Boaters, swimmers, and hikers tend to congregate there. *Sporobolus asper* is recommended for Endangered species status in Vermont (10 V. S. A., Chapter 123) to protect it from possible development of the site.

Sporobolus cryptandrus

Sporobolus cryptandrus (Torrey) A. Gray, is a native North American perennial from south and west of Vermont. Sand dropseed was first collected in 1980 (*Weir 40* MASS) in a Rutland railroad yard. It did not persist there, but subsequent introductions became well established on open sandy ground or railroad embankments in Colchester (Zika et al., 1983) and in the lower Connecticut and West River Valleys in Vermont.

Recent Vermont records are: Bennington Co., Pownal (limestone cliff) 1982; Washington Co., Waterbury 1981; Windham Co., Jamaica 1981, Rockingham 1983; Windsor Co., Springfield 1981, and White River Junction 1981.

S. cryptandrus is too common to require legal protection in Vermont. Dore and McNeill (1980) note it has spread rapidly along rails and roads in Ontario. They suggest that the pericarp, sticky when wet, aids its dispersal. Although a tall grass (up to 1.3 m), sand dropseed is inconspicuous when the inflorescence does not expand beyond the apical leaf sheath.

Tridens flavus

Tridens flavus (L.) A. S. Hitchcock [= *Triodia flava* (L.) Smyth] is a tall, dark purple and handsome perennial. Purpletop was discovered in Vermont in 1912 in Townshend, Windham Co. (Wheeler, 1913). With no subsequent documentation, Countryman (1978) placed it on the state Rare and Endangered species list. Like *Leptoloma, Tridens* recently colonized sandy roadsides at lower elevations in southeastern Vermont. Conspicuous in the autumn flora of the West and Connecticut River drainages, purpletop was as far north as Westminster on the banks of Interstate 91 in 1982. By 1984, it had advanced along the freeway 15 km north into Springfield. D. M. Ladd (1979, unpubl. M.S. thesis, S. Ill. U., Carbondale) did not report *Tridens* in Washington Co., although he collected along the major railroad lines. In 1981, the Montpelier population was located in a railroad yard. *Tridens,* now common and weedy, does not require legal protection in Vermont. It is also spreading north in New Hampshire, and was recently found in southern Canada (Catling et al., 1978).

Recent Vermont records are: Bennington Co., Dorset 1983; Washington Co., Montpelier 1981; Windham Co., Brattleboro

1981, Dummerston 1981, Guilford 1982 observation, Jamaica 1981, Putney 1981, Rockingham 1981, Townshend 1981, Westminster 1982 and 1984 observations; and Windsor Co., Springfield 1984 observation.

Zea mays

Zea mays L., maize, is commonly cultivated and repeatedly adventive in Vermont. Flynn (1911) reported corn as "occasional in waste places" in the vicinity of Burlington. Kittredge (1939) noted *Zea* was "occasional along streams and fencerows" in the Woodstock area. Seymour (1969) stated it "occurs occasionally." D. M. Ladd (1979, unpubl. M.S. thesis, S. Ill. U., Carbondale) found it wild in Washington Co., in Berlin, Middlesex and Roxbury. There were no vouchers supporting the literature reports, and corn was omitted in the most recent state checklist (Atwood et al., 1973). These collections are apparently the first for Vermont: Chittenden Co., Burlington, 1980 and 1981 (*Zika 2365* MASS, NEBC, VT; *Zika 5252* VT); Rutland Co., Rutland, railroad yards in 1980 and 1981 (*Zika 1999* MASS, VT; *Zika 5276* VT), and pasture, Shoreham, 1984 (*Zika 8430* VT).

SUMMARY

Several trends were observed in the last 20 years. They are summarized as follows:

(1) Most of the species studied, except *Glyceria acutiflora* and *Sporobolus asper,* were under-represented in herbaria at the start of the study in 1980, as suggested by Countryman (1978). However, *Glyceria acutiflora* and *Sporobolus asper* maintained their status as rare natives in Vermont. They are recommended for state Endangered species status.

(2) Populations of *Aristida dichotoma, Eragrostis capillaris, Leptoloma cognatum, Panicum dichotomiflorum, Sporobolus cryptandrus,* and *Tridens flavus* recently advanced north in Vermont. This movement parallels the northern spread of several grasses in New York state (Smith, 1965) and into Ontario (Dore and McNeill, 1980). *Poa bulbosa* L. is another recent arrival in the northeast, in Massachusetts (Grayum and Rohman, 1986) and Vermont (Zika, 1986).

(3) Five native species formerly considered Rare and Endan-

gered in Vermont (Countryman, 1978) are increasing and aggressively colonizing disturbed ground and are no longer Rare: *Eragrostis capillaris, E. frankii, Leptoloma cognatum, Panicum dichotomiflorum,* and *Tridens flavus.* In addition, the natives *Aristida dichotoma* and *Sporobolus cryptandrus,* essentially absent 20 years ago, are now widespread and weedy.

(4) Mobile (weedy) taxa spread along transportation corridors, where open, early successional habitats are maintained and means of long-distance dispersal are readily available. Railroads are important or primary habitats for the three *Aristida* species, *Diplachne acuminata, Eragrostis capillaris,* and *Panicum dichotomiflorum.* The annual cultivar *Zea mays* repeatedly occurs as a railroad yard weed. Sunny roadsides provide habitat for *Eragrostis frankii, Leptoloma cognatum, Panicum dichotomiflorum, Sporobolus cryptandrus,* and *Tridens flavus.*

(5) Few collectors are active in Vermont in the autumn. The distribution and abundance of the *Aristida* and *Sporobolus* taxa, as well as *Tridens flavus,* may have been poorly understood owing to their tardy anthesis (late August–October).

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LITERATURE CITED

Atwood, J. T., W. D. Countryman, R. A. Jervis, D. H. Miller, F. C. Seymour and M. L. Smith. 1973. Checklist of Vermont Plants. Vt. Bot. and Bird Club.

Brainerd, E., L. R. Jones and W. W. Eggleston. 1900. Flora of Vermont. Free Press Assoc., Burlington, VT.

Campbell, C. S. and L. M. Eastman. 1980. Flora of Oxford County, Maine. Univ. of Maine Life Sciences and Ag. Exp. Sta. Technical Bull. 99, Orono.

Catling, P. M., A. A. Reznicek and J. L. Riley. 1978. Some new and interesting grass records from southern Ontario. Canad. Field-Naturalist 91: 350–359.

Countryman, W. D. 1978. Rare and Endangered Vascular Plant Species in Vermont. The New England Bot. Club in cooperation with the U.S. Fish and Wildlife Service, Newton Corner, MA.

Dore, W. G. and J. McNeill. 1980. Grasses of Ontario. Agric. Canada Research Branch Mono. 26, Ottawa.

Flynn, N. F. 1911. Flora of Burlington and Vicinity. A List of Fern and Seed Plants Growing Without Cultivation. Free Press Printing Co., Burlington, VT.

Grayum, M. H. and M. F. Rohman. 1986. Four Eurasian adventives in the flora of western Massachusetts. Rhodora 88: 413–417.

Kirk, G. L. 1910. Two Vermont grasses rediscovered. Rhodora 12: 40.

———. 1911. *Glyceria acutiflora* in Vermont. Rhodora 13: 92.

Kittredge, E. M. 1939. Grasses and Sedges of Woodstock, Vermont. The Elm Tree Press, Woodstock, VT.

McNeill, J. 1979. *Diplachne* and *Leptochloa* (Poaceae) in North America. Brittonia 31: 399–404.

Muhlenbach, V. 1979. Contributions to the Synanthropic (Adventive) Flora of the Railroads in St. Louis, Missouri, U. S. A. Ann. Missouri Bot. Gard. 66: 1–108.

Pease, A. S. 1964. A Flora of Northern New Hampshire. New England Bot. Club, Cambridge, MA.

Richards, C. D., F. Hyland and L. M. Eastman. 1983. Check-list of the Vascular Plants of Maine. Second Rev. The Lincoln Press, Sanford, ME.

Seymour, F. C. 1967. Notes from the Pringle Herbarium, II. Rhodora 69: 377–380.

———. 1969. The Flora of Vermont. Vermont Agric. Exp. Sta. Bull. 660, Burlington, VT.

———. 1970. Notes from the Pringle Herbarium III. Rhodora 72: 47–50.

———. 1982. The Flora of New England, 2nd ed. Phytologia Memoirs V, Plainfield, NJ.

Smith, S. J. 1965. Checklist of the Grasses of New York State. New York State Mus. and Sci. Service Bull. No. 403, Albany.

Underwood, J. G. 1913. Plants new to Hartland, collected in 1912. Vermont Bot. Club Bull. 8: 22–23.

Wheeler, L. A. 1912. Rare plants of the West River Valley (Abstract). Vermont Bot. Club Bull. 7: 13.

———. 1913. Additions to the flora of the West River Valley in 1912 (Abstract). Vermont Bot. Club Bull. 8: 14–15.

Zika, P. F. 1986. The first record of *Poa bulbosa* L. (Poaceae) for Vermont. Rhodora 88: 419–420.

———. 1988. Contributions to the flora of the Lake Champlain Valley, New York and Vermont, II. Bull. Torrey Bot. Club 115: 218–220.

———, R. J. Stern and H. E. Ahles. 1983. Contributions to the flora of the Lake Champlain Valley, New York and Vermont. Bull. Torrey Bot. Club 110: 366–369.

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